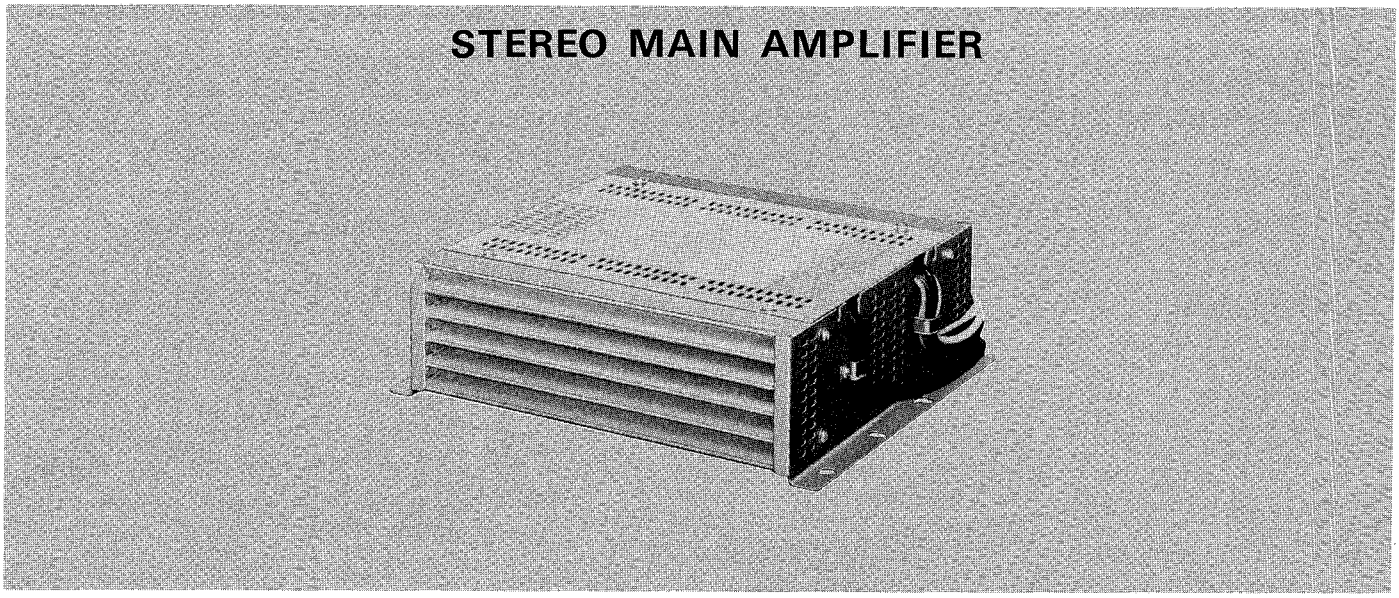
ORDER NO. APD-8204-601

Service Manual

AUTO PRODUCTS

CX-M150EN

STEREO MAIN AMPLIFIER



SPECIFICATIONS*

Power Supply:	DC 12 V (11 ~ 16V) Test Voltage 14.4 V Negative Ground
Current Consumption:	16A (at 2 x 50 W)
Speaker Impedance:	4 Ω
Power Output:	2 x 75 W (DIN 45 324)
Maximum Power Output:	2 x 100 W
Total Harmonic Distortion:	0.1% (20 Hz ~ 20,000 Hz) at rated output. 0.05% (1,000 Hz) at rated output –3dB
Signal to Noise Ratio:	100 dB
Frequency Response:	1 Hz ~ 80,000 Hz
Stereo Separation:	70 dB
Residual Noise:	140μV
Damping Factor:	50 (4 Ω)
Input Sensitivity:	300 mV
Input Impedance:	47k Ω
Dimensions**:	193(W) x 232(D) x 66(H) mm
Weight**:	3.1 kg

* Specifications subject to change without notice.
** Weight and Dimensions shown are approximate.

FEATURES

- 100 W x 2, 2-channel stereo power amplifier.
- DC 12 V, Negative ground.
- Built-in DC-DC converter.
- DIN connector connection.
- O.C.L. (Output Capacitor Less)
- Remote control system with a car stereo.
- Component system with a car stereo Model CX-D89EN or CX-D108EN.

CAUTION

- **Constant operation of the stereo main amplifier is not necessary.**
- **Due to its large output, the current consumption of the unit is also large; therefore, the unit should not be used more than 30 minutes with the engine in an idling state or stopped. Otherwise, the battery may deteriorate so that starting of the engine may become impossible.**
- **Use ungrounded speaker only.**
- **Power supply cord (Blue) should be connected to an accessory terminal on the ignition switch.**
- **Battery cord (Yellow) should be connected to battery.**
- **Use speakers rates at 50 W or more.**
- **Be sure to connect the speakers before operating.**
- **Place the unit in a well ventilated area.**
- **Keep this unit away from rain or water.**

Panasonic

Matsushita Electric Trading Co., Ltd.

CX-M150EN

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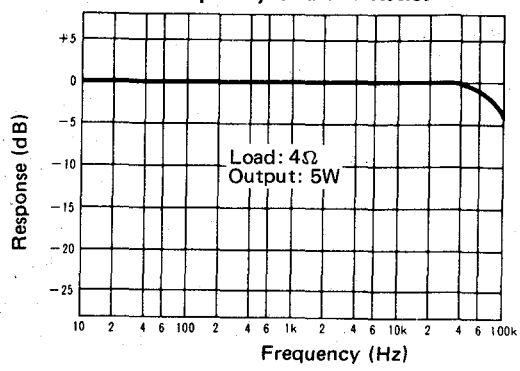
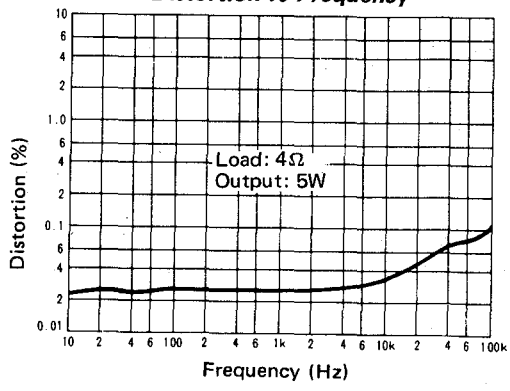
FREQUENCY CHARACTERISTICS

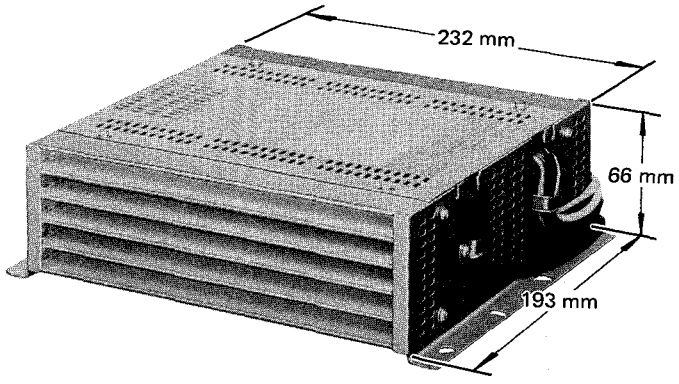
Frequency Characteristics



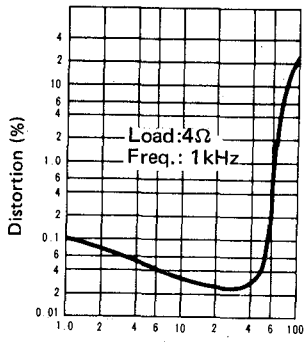
Distortion vs Frequency



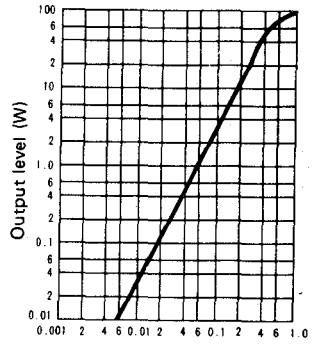
DIMENSIONS



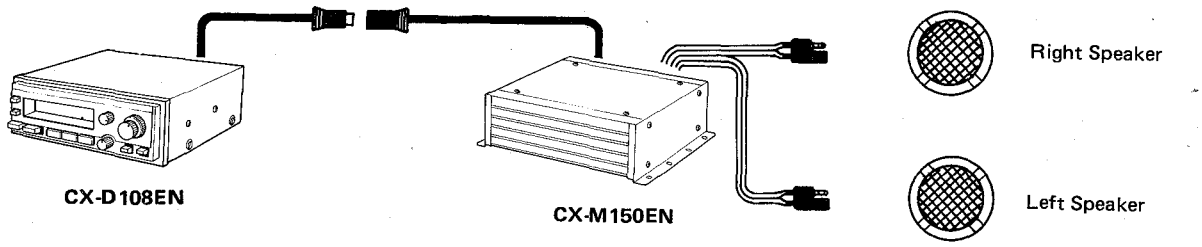
Distortion vs Output level



Output level vs Input level characteristics

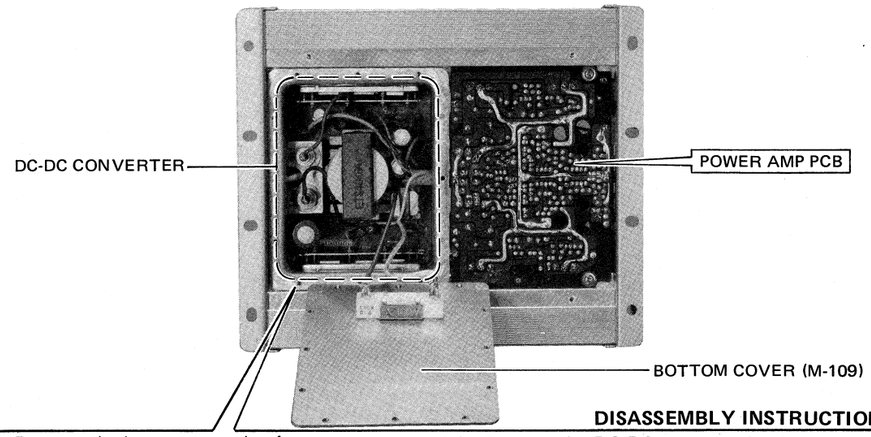


COMPOSITION AND SYSTEM CONNECTIONS



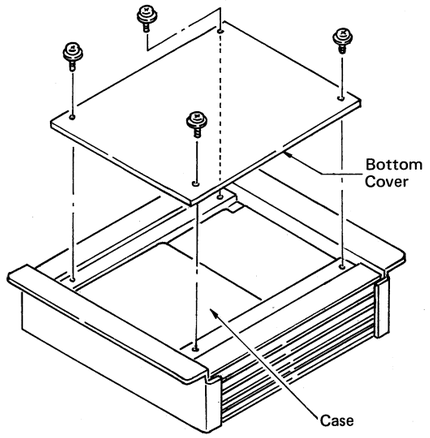
PARTS LOCATION

- Numbers in ( ), are listed in the Replacement Parts List, starting on page 8.
- For other parts location, see the EXPLODED VIEW, page 7.

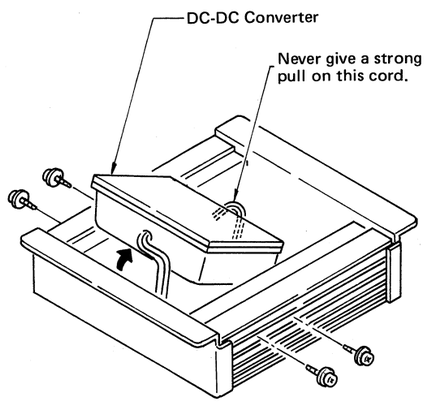


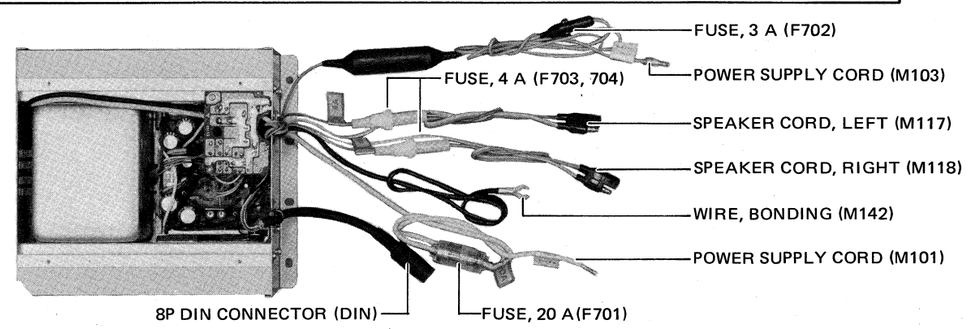
DISASSEMBLY INSTRUCTIONS

1. Remove the bottom cover by 4 screws.



2. Remove the DC-DC converter by 4 screws.

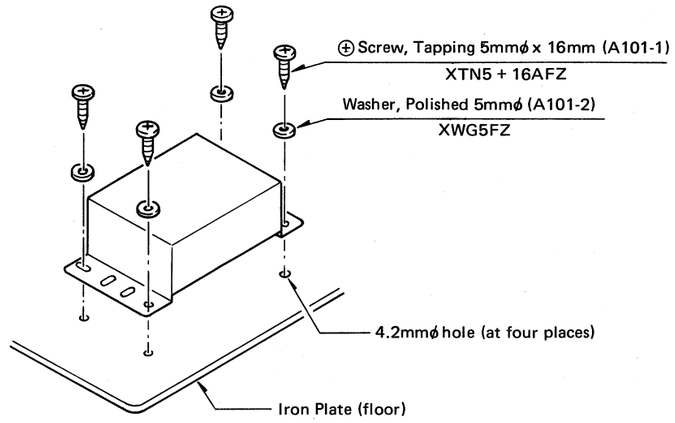



FUSE, 3 A (F702)
FUSE, 4 A (F703, 704)
POWER SUPPLY CORD (M103)
SPEAKER CORD, LEFT (M117)
SPEAKER CORD, RIGHT (M118)
WIRE, BONDING (M142)
POWER SUPPLY CORD (M101)
8P DIN CONNECTOR (DIN)
FUSE, 20 A (F701)

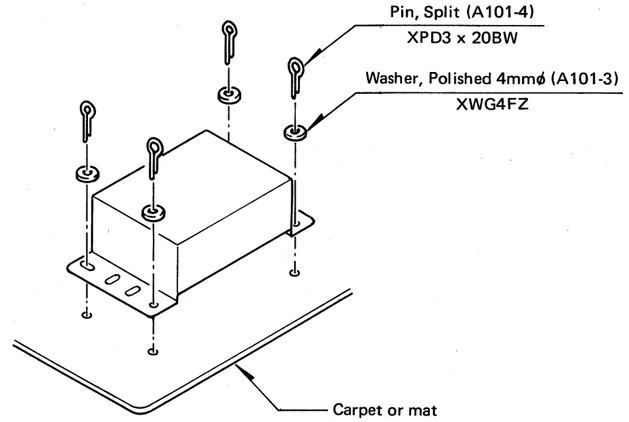
CX-M150EN

INSTALLATION INSTRUCTIONS

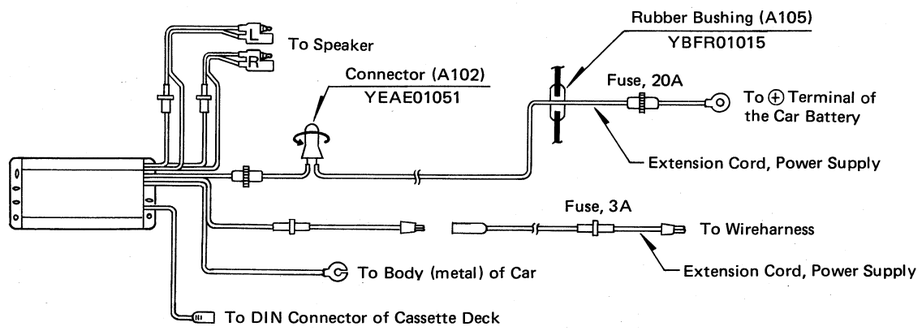
■ **Installation Type 1**



Installation Type 2



■ **Wiring Method**



SCHEMATIC DIAGRAM MODEL CX-M150EN

DIN CONNECTOR

1. Rch Input ⊕ (green)
2. Lch Input ⊕ (white)
3. Power Supply, Illumination (yellow)
4. Rch Input ⊖ (black)
5. Lch Input ⊖ (brown)
6. Power Supply (red)
7. Power Supply, Relay Drive (blue)
8. Ground

POWER AMP
Q201,301
YBAN2SC1627A

POWER AMP
Q202,302
YBAN2SA817A

PRE AMP
IC201,202
YBAMNE5538N

TEMPERATURE COMPENSATOR
D301,302
YAAD007

RECTIFIER
D705 YBADCTU22S
D706 YBADCTU22R

VOLTAGE STABILIZER
D703,704
YEAD1S283

GENERATOR
Q701,702,703,704
YBAN2SD717

Left Speaker

Right Speaker

Power Supply (BAT)

Ground

Power Supply

PROTECTOR
D702
YEADU05B

PROTECTOR
D701 YEADU05B
D710 YEAD030
D712 YEAD030

PROTECTOR
D708
YEAD030

PROTECTOR
D714
YEAD030

VOLTAGE STABILIZER
D709
YEADWZ050

VOLTAGE STABILIZER
D203,303
YBADWZ150

VOLTAGE STABILIZER
Q305
2SC1318-QRS

VOLTAGE STABILIZER
Q205
2SA720

POWER AMP
Q204,304
2SD845

POWER AMP
Q203,303
2SB755

TEMPERATURE COMPENSATOR
D201,202
YAAD007

VOLTAGE STABILIZER
D713 YEAD030

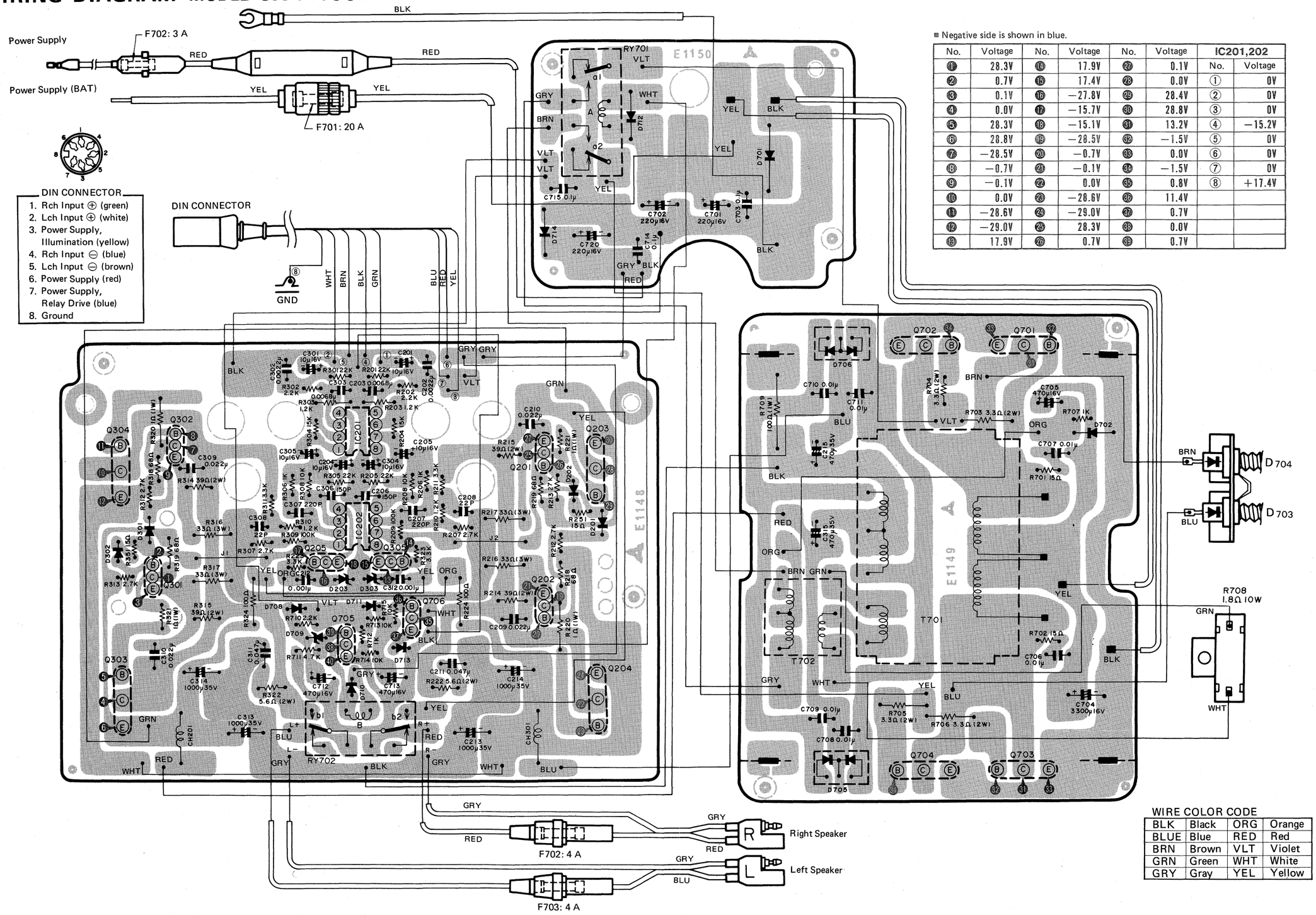
VOLTAGE STABILIZER
Q705,706
2SC1318-QRS

NOTES:

1) Voltage measurements are with respect to ground, with a digital voltmeter, with controls set for normal operation, no signal applied, 14.4 V DC, power supply.

- Exact value determined by production process. This schematic diagram is the latest at the time of printing and subject to change without notice. Replace same value as original parts.
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

WIRING DIAGRAM MODEL CX-M150EN



■ Negative side is shown in blue.

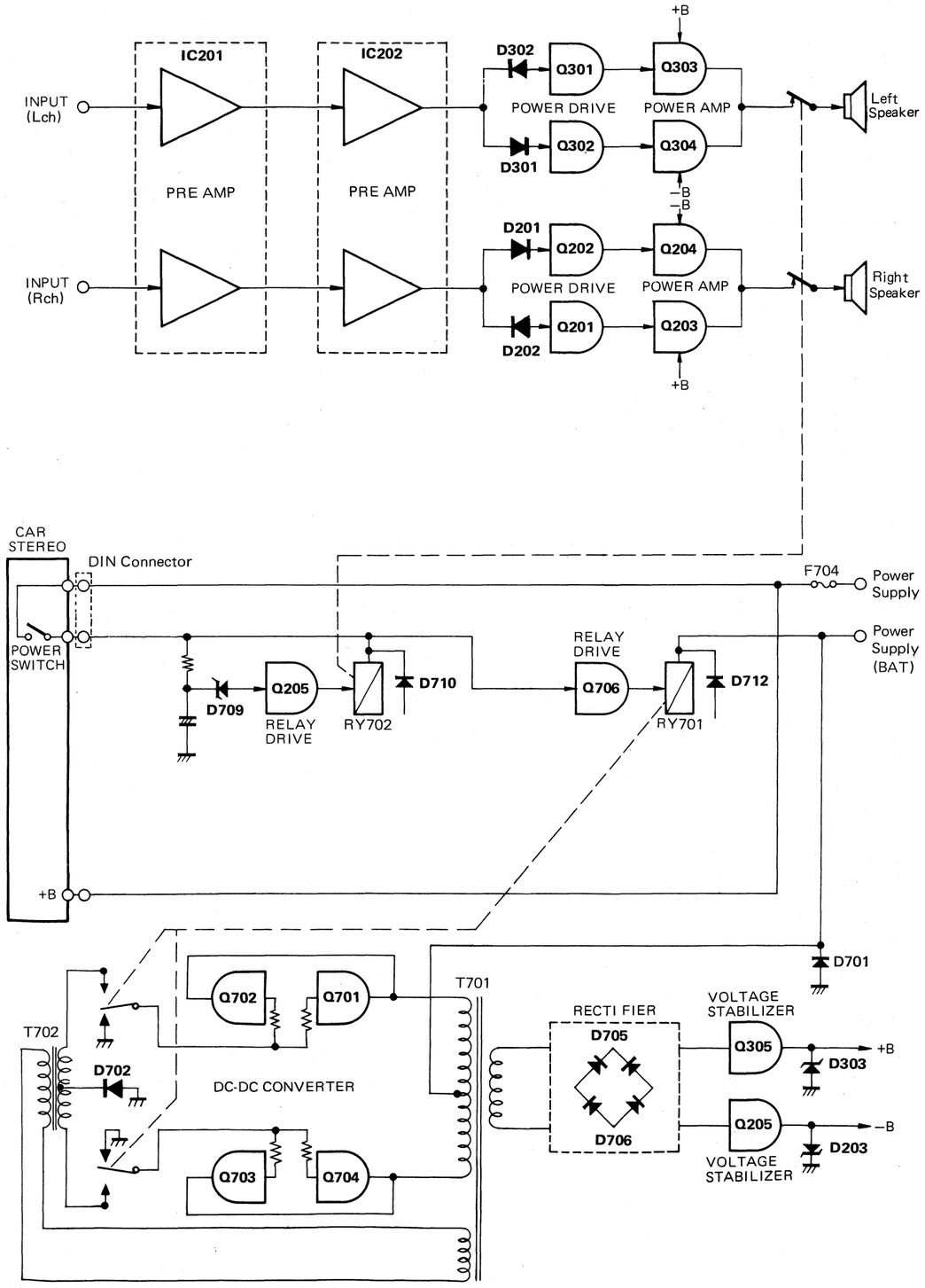
No.	Voltage	No.	Voltage	No.	Voltage	IC201,202	
						No.	Voltage
①	28.3V	⑭	17.9V	㉗	0.1V	①	0V
②	0.7V	⑮	17.4V	㉘	0.0V	②	0V
③	0.1V	⑯	−27.8V	㉙	28.4V	③	0V
④	0.0V	⑰	−15.7V	㉚	28.8V	④	−15.2V
⑤	28.3V	⑱	−15.1V	㉛	13.2V	⑤	0V
⑥	28.8V	⑲	−28.5V	㉜	−1.5V	⑥	0V
⑦	−28.5V	⑳	−0.7V	㉝	0.0V	⑦	0V
⑧	−0.7V	㉑	−0.1V	㉞	−1.5V	⑧	+17.4V
⑨	−0.1V	㉒	0.0V	㉟	0.8V		
⑩	0.0V	㉓	−28.6V	㊱	11.4V		
⑪	−28.6V	㉔	−29.0V	㊲	0.7V		
⑫	−29.0V	㉕	28.3V	㊳	0.0V		
⑬	17.9V	㉖	0.7V	㊴	0.7V		

WIRE COLOR CODE

BLK	Black	ORG	Orange
BLUE	Blue	RED	Red
BRN	Brown	VLT	Violet
GRN	Green	WHT	White
GRY	Gray	YEL	Yellow

AMPLIFIER

BLOCK DIAGRAM

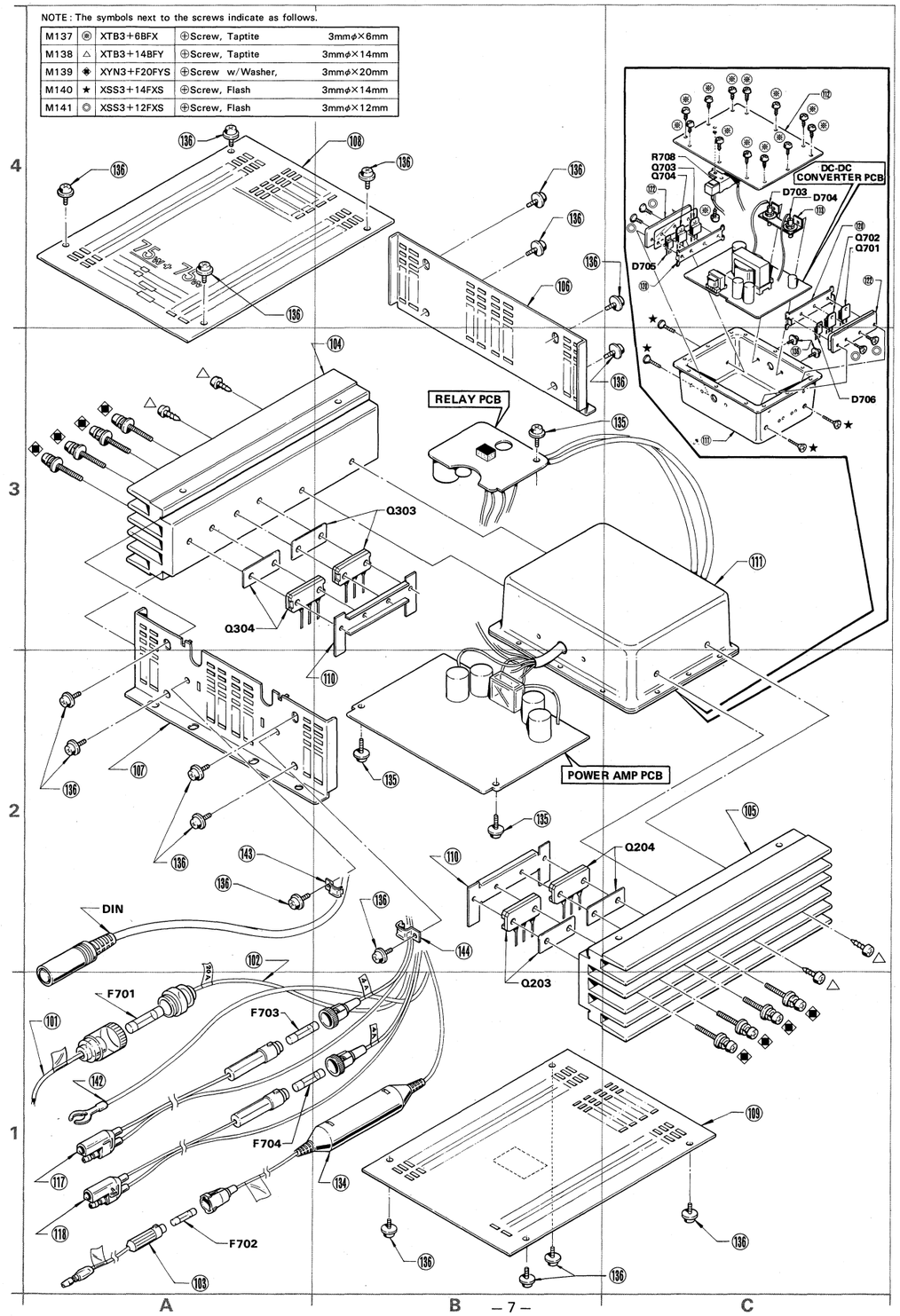


EXPLODED VIEW

■ Numbers ○ are indicated REF. NO. in the REPLACEMENT PARTS LIST.

NOTE : The symbols next to the screws indicate as follows.

M137	⊛	XTB3+6BFX	⊕Screw, Taptite	3mmϕ×6mm
M138	△	XTB3+14BFY	⊕Screw, Taptite	3mmϕ×14mm
M139	❋	XYN3+F20FYS	⊕Screw w/Washer,	3mmϕ×20mm
M140	★	XSS3+14FXS	⊕Screw, Flash	3mmϕ×14mm
M141	◎	XSS3+12FXS	⊕Screw, Flash	3mmϕ×12mm



Replacement Parts List
Model NO.CX-M150EN

NOTES:

1. Be sure to make your orders of replacement parts according to this list.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Next to the Ref. No. in the parts list is a location key, to show the general location of the parts shown in the exploded drawing, as in a road map.

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
		MISCELLANEOUS		
⚠F701 (1-A)	XBB1F200NS1	Fuse, 20 A	1	
⚠F702 (1-A)	XBB1C30NR1	Fuse, 3 A	1	
⚠F703, 704	XBB1F40NR5	Fuse, 4 A	2	
DIN (2-A)	YEAE01349	8P DIN Connector	1	
M101 (1-A)	YBAJ01090	Power Supply Cord (Yellow)	1	
M102 (2-A)	YBAJ01089	Power Supply Cord (Yellow)	1	
M103 (1-A)	YEAJ01534	Power Supply Cord (Blue)	1	
M104 (3-B)	YEFF01278	Heat Sink	1	
M105 (2-C)	YEFF01279	Heat Sink	1	
M106 (4-B)	YEFA09099	Side Plate	1	
M107 (2-A)	YEFA09100	Side Plate	1	
M108 (4-B)	YEFA03523	Upper Cover	1	
M109 (1-C)	YEFA05236	Bottom Cover	1	
M110 (2-B)	YBFX014212	Mounting Bracket , IC	2	
M111 (3-C)	YEFA13375	Case	1	
M112 (4-C)	YEFA03472	Upper Cover	1	
M113 (4-C)	YEFX0211194	Mounting Bracket , Diode	1	
M117 (1-A)	YEAJ03457	Speaker Cord, Left	1	
M118 (1-A)	YEAJ03458	Speaker Cord, Right	1	
M119	YBFX014232	Mounting Bracket	2	
M120 (4-C)	YEFX0211193	Mounting Bracket	2	
M121	YEAJ01522	Power Supply Cord	1	
M122 (4-C)	YEFF01281	Heat Sink	1	
M133	YEFF01289	Heat Sink	1	
M134 (1-B)	YEAJ01520	Power Supply Cord	1	
M135	YEJT03009	Screw, Cup Tight 3mmø x 8mm	3	
M136	YEJT03016	Screw, Cup Tight 3mmø x 5mm	20	
M137	XTB3 + 6BFX	⊕ Screw, Tapping 3mmø x 6mm	13	
M138	XTB3 + 14BFY	⊕ Screw, Tapping 3mmø x 14mm	4	
M139	XYN3 + F20FYS	⊕ Screw w/Washer, 3mmø x 20mm	8	
M140	XSS3 + 14FXS	⊕ Screw, Flash 3mmø x 14mm	4	
M141	XSS3 + 12FXS	⊕ Screw, Flash 3mmø x 12mm	4	
M142 (1-A)	YEAJ09147	Wire, Bonding	1	
M143 (2-A)	YAFX016027	Cord Clamper	1	
M144 (2-B)	YAFX016042	Cord Clamper	1	
M145	YEAJ09146	Wire, Bonding	1	

ICs AND TRANSISTORS

POWER AMP BLOCK

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
IC201, 202	YBAMNE5538N	Pre Amp	2	
Q201, 301	YBAN2SC1627A	Power Amp	2	
Q202, 302	YBAN2SA817A	Power Amp	2	
Q305, 705 706	2SC1318	Voltage Stabilizer	3	
Q205	2SA720	Voltage Stabilizer	1	

DC-DC CONVERTER BLOCK

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
Q701, 702 703, 704	YBAN2SD717	Generator	4	

MAIN UNIT

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
Q203, 303	YBAN2SB755	Power Amp	2	
Q204, 304	YBAN2SD845	Power Amp	2	

DIODES

POWER AMP BLOCK

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
D201, 202 301, 302	YAAD007	Temperature Compensator	4	
D203, 303	YBADWZ150	Voltage Stabilizer	2	
D708, 710 713	YEAD030	Protector	3	
D709	YEADWZ050	Voltage Stabilizer	1	

DC-DC CONVERTER BLOCK

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
D702	YEADU05B	Protector	1	
D705	YBADCTU22S	Rectifier	1	
D706	YBADCTU22R	Rectifier	1	

CONTROL BLOCK

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
D701	YEADU05B	Protector	1	
D712, 714	YEAD030	Protector	2	

MAIN UNIT

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
D703, 704	YEAD1S283	Voltage Stabilizer	2	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
		CAPACITORS		
		POWER AMP BLOCK		
C201	ECEA1CS100	10 MFD 16WV Electrolytic	1	
C202	YECQX1H222K	0.0022 MFD 50WV ±10% Polyester	1	
C203	YECQN1H681K	680 PF 50WV ±10% Polyester	1	
C204	ECEA1CS100	10 MFD 16WV Electrolytic	1	
C205	ECEA1CS100	10 MFD 16WV Electrolytic	1	
C206	YECCD1H151JM	150 PF 50WV ±5% Ceramic	1	
C207	YECCD1H221JM	220 PF 50WV ±5% Ceramic	1	
C208	YECCD1H220KM	22 PF 50WV ±10% Ceramic	1	
C209	YECQX1H223M	0.022 MFD 50WV ±20% Polyester	1	
C210	YECQX1H223M	0.022 MFD 50WV ±20% Polyester	1	
C211	YECQX1H473M	0.047 MFD 50WV ±20% Polyester	1	
C212	YECQX1H102K	0.001 MFD 50WV ±10% Polyester	1	
C213	ECEA1VS102	1000 MFD 35WV Electrolytic	1	
C214	ECEA1VS102	1000 MFD 35WV Electrolytic	1	
C301	ECEA1CS100	10 MFD 16WV Electrolytic	1	
C302	YECQX1H222K	0.0022 MFD 50WV ±10% Polyester	1	
C303	YECQX1H681K	680 PF 50WV ±10% Polyester	1	
C304	ECEA1CS100	10 MFD 16WV Electrolytic	1	
C305	ECEA1CS100	10 MFD 16WV Electrolytic	1	
C306	YECCD1H151JM	150 PF 50WV ±5% Ceramic	1	
C307	YECCD1H221JM	220 PF 50WV ±5% Ceramic	1	
C308	YECCD1H220KM	22 PF 50WV ±10% Ceramic	1	
C309	YECQX1H223M	0.022 MFD 50WV ±20% Polyester	1	
C310	YECQX1H223M	0.022 MFD 50WV ±20% Polyester	1	
C311	YECQX1H473M	0.047 MFD 50WV ±20% Polyester	1	
C312	YECQX1H102K	0.001 MFD 50WV ±10% Polyester	1	
C313	ECEA1VS102	1000 MFD 35WV Electrolytic	1	
C314	ECEA1VS102	1000 MFD 35WV Electrolytic	1	
C712	ECEA1CS471	470 MFD 16WV Electrolytic	1	
C713	ECEA1CS221	220 MFD 16WV Electrolytic	1	
C750	YECQX1H104M	0.1 MFD 50WV ±20% Polyester	1	
		DC-DC CONVERTER BLOCK		
C215	ECEA1VG471S	470 MFD 35WV Electrolytic	1	
C315	ECEA1VG471S	470 MFD 35WV Electrolytic	1	
C704	ECEA1CG332S	3300 MFD 16WV Electrolytic	1	
C705	ECEA1CG471S	470 MFD 16WV Electrolytic	1	
C706	YECQX1H103M	0.01 MFD 50WV ±20% Polyester	1	
C707	YECQX1H103M	0.01 MFD 50WV ±20% Polyester	1	
C708	YECQX1H103M	0.01 MFD 50WV ±20% Polyester	1	
C709	YECQX1H103M	0.01 MFD 50WV ±20% Polyester	1	
C710	YECQX1H103M	0.01 MFD 50WV ±20% Polyester	1	
C711	YECQX1H103M	0.01 MFD 50WV ±20% Polyester	1	
		CONTROL BLOCK		
C701	ECEA1CF221	220 MFD 16WV Electrolytic	1	
C702	ECEA1CF221	220 MFD 16WV Electrolytic	1	
C703	YECCD16104M	0.1 MFD 16WV ±20% Ceramic	1	
C714	YECCD16104M	0.1 MFD 16WV ±20% Ceramic	1	
C715	YECCD16104M	0.1 MFD 16WV ±20% Ceramic	1	
C720	ECEA1CS222SZ	2200 MFD 16WV Electrolytic	1	

RESISTORS

POWER AMP BLOCK

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
R201	ERD25VJ473	47k OHM 1/4W ±5% Carbon	1	
R202	ERD25VJ222	2.2k OHM 1/4W ±5% Carbon	1	
R203	ERD25VJ122	1.2k OHM 1/4W ±5% Carbon	1	
R204	ERD25VJ153	15k OHM 1/4W ±5% Carbon	1	
R205	ERD25VJ223	22k OHM 1/4W ±5% Carbon	1	
R206	ERD25VJ102	1k OHM 1/4W ±5% Carbon	1	
R207	ERD25VJ272	2.7k OHM 1/4W ±5% Carbon	1	
R208	ERD25VJ103	10k OHM 1/4W ±5% Carbon	1	
R209	ERD25VJ104	100k OHM 1/4W ±5% Carbon	1	
R210	ERD25VJ122	1.2k OHM 1/4W ±5% Carbon	1	
R211	ERD25VJ332	3.3k OHM 1/4W ±5% Carbon	1	
R212	ERD25VJ272	2.7k OHM 1/4W ±5% Carbon	1	
R213	ERD25VJ272	2.7k OHM 1/4W ±5% Carbon	1	
R214	ERG2ANJ390	39 OHM 2W ±5% Metal Film	1	
R215	ERG2ANJ390	39 OHM 2W ±5% Metal Fim	1	
R216	ERG3ANJ330	33 OHM 3W ±5% Metal Film	1	
R217	ERG3ANJ330	33 OHM 3W ±5% Metal Film	1	
R218	ERD25VJ680	68 OHM 1/4W ±5% Carbon	1	
R219	ERD25VJ680	68 OHM 1/4W ±5% Carbon	1	
R220	ERX1ANJ1R0	1 OHM 1W ±5% Metal Film	1	
R221	ERX1ANJ1R0	1 OHM 1W ±5% Metal Film	1	
R222	ERX2ANJ5R6	5.6 OHM 2W ±5% Metal Film	1	
R223	ERD25VJ332	3.3k OHM 1/4W ±5% Carbon	1	
R224	ERD25TJ101	100 OHM 1/4W ±5% Carbon	1	
R251	ERD25VJ150	15 OHM 1/4W ±5% Carbon	1	
R301	ERD25VJ473	47k OHM 1/4W ±5% Carbon	1	
R302	ERD25VJ222	2.2k OHM 1/4W ±5% Carbon	1	
R303	ERD25VJ122	1.2k OHM 1/4W ±5% Carbon	1	
R304	ERD25VJ153	15k OHM 1/4W ±5% Carbon	1	
R305	ERD25VJ223	22k OHM 1/4W ±5% Carbon	1	
R306	ERD25VJ102	1k OHM 1/4W ±5% Carbon	1	
R307	ERD25VJ272	2.7k OHM 1/4W ±5% Carbon	1	
R308	ERD25VJ103	10k OHM 1/4W ±5% Carbon	1	
R309	ERD25VJ104	100k OHM 1/4W ±5% Carbon	1	
R310	ERD25VJ122	1.2k OHM 1/4W ±5% Carbon	1	
R311	ERD25VJ332	3.3k OHM 1/4W ±5% Carbon	1	
R312	ERD25VJ272	2.7k OHM 1/4W ±5% Carbon	1	
R313	ERD25VJ272	2.7k OHM 1/4W ±5% Carbon	1	
R314	ERG2ANJ390	39 OHM 2W ±5% Metal-Film	1	
R315	ERG2ANJ390	39 OHM 2W ±5% Metal-Film	1	
R316	ERG3ANJ330	33 OHM 3W ±5% Metal-Film	1	
R317	ERG3ANJ330	33 OHM 3W ±5% Metal-Film	1	
R318	ERD25VJ680	68 OHM 1/4W ±5% Carbon	1	
R319	ERD25VJ680	68 OHM 1/4W ±5% Carbon	1	
R320	ERX1ANJ1R0	1 OHM 1W ±5% Metal-Film	1	
R321	ERX1ANJ1R0	1 OHM 1W ±5% Metal-Film	1	
R322	ERX2ANJ5R6	5.6 OHM 2W ±5% Metal Film	1	
R323	ERD25VJ332	3.3k OHM 1/4W ±5% Carbon	1	
R324	ERD10TJ101	100 OHM 1/8W ±5% Carbon	1	
R351	ERD25VJ150	15 OHM 1/4W ±5% Carbon	1	
R710	ERD25VJ682	6.8k OHM 1/4W ±5% Carbon	1	
R711	ERD25VJ103	10k OHM 1/4W ±5% Carbon	1	
R712	ERD25VJ102	1k OHM 1/4W ±5% Carbon	1	
R713	ERD25VJ222	2.2k OHM 1/4W ±5% Carbon	1	
R714	ERD25VJ103	10k OHM 1/4W ±5% Carbon	1	
R715	ERD25VJ103	10k OHM 1/4W ±5% Carbon	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
		DC-DC CONVERTER BLOCK		
R701	ERD25VJ150	15 OHM 1/4W ±5% Carbon	1	
R702	ERD25VJ150	15 OHM 1/4W ±5% Carbon	1	
R703	ERX2ANJ3R3	3.3 OHM 2W ±5% Metal Film	1	
R704	ERX2ANJ3R3	3.3 OHM 2W ±5% Metal Film	1	
R705	ERX2ANJ3R3	3.3 OHM 2W ±5% Metal Film	1	
R706	ERX2ANJ3R3	3.3 OHM 2W ±5% Metal Film	1	
R707	ERD25VJ102	1k OHM 1/4W ±5% Carbon	1	
R709	ERG1ANJ101	100 OHM 1W ±5% Metal Film	1	
		MAIN UNIT		
R708	ERF10BM1R8	1.8 OHM 10W ±20% Flame	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
		COILS AND TRANSFORMERS		
CH201, 301	YBLZ10K002	Choke Coil	2	
T701	ETS49K8A	OSC Coil	1	
T702	ETS19K1A	OSC Coil	1	
		RELAYS		
RY701	YBAS15AW4411	Relay	1	
RY702	YBAS15AW4411	Relay	1	
		ACCESSORIES		
A101	YEP9BS684	Mounting Screw Kit	1	
A101-1	XTN5 + 16AFZ	⊕ Screw, Tapping 5mmø x 16mm	(4)	
A101-2	XWG5FZ	Washer, Polished	(4)	
A101-3	XWG4FZ	Washer, Polished	(4)	
A101-4	XPD3X20BW	Pin, Split	(4)	
A102	YEAE01051	Connector	1	
A103	YEAJ02217	Extention Cord, Power Supply	1	
A104	YEAJ02218	Extention Cord, Power Supply	1	
A105	YBFR01015	Rubber Bushing	1	
		PRINTING		
A106	YEFM28336	Instruction Book	1	